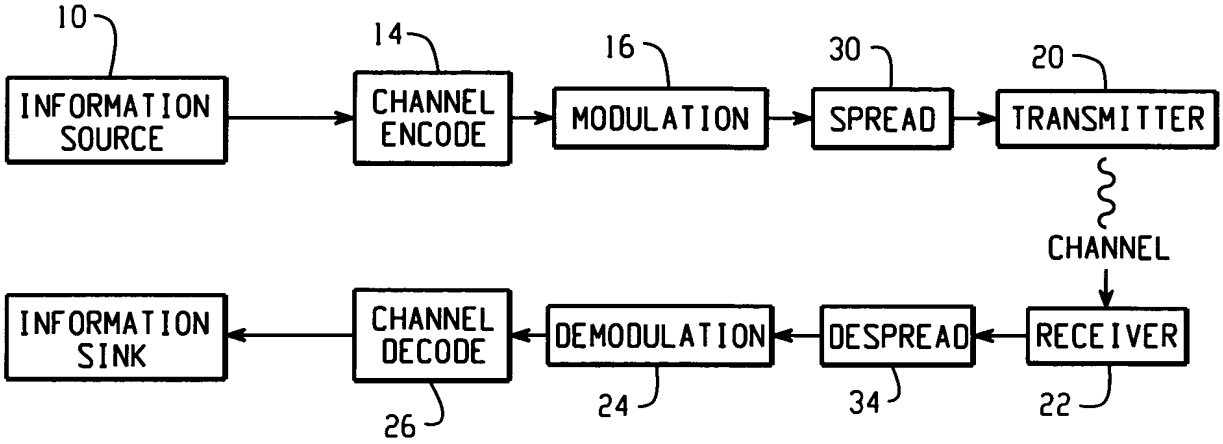

Fig. 1
PRIOR ART

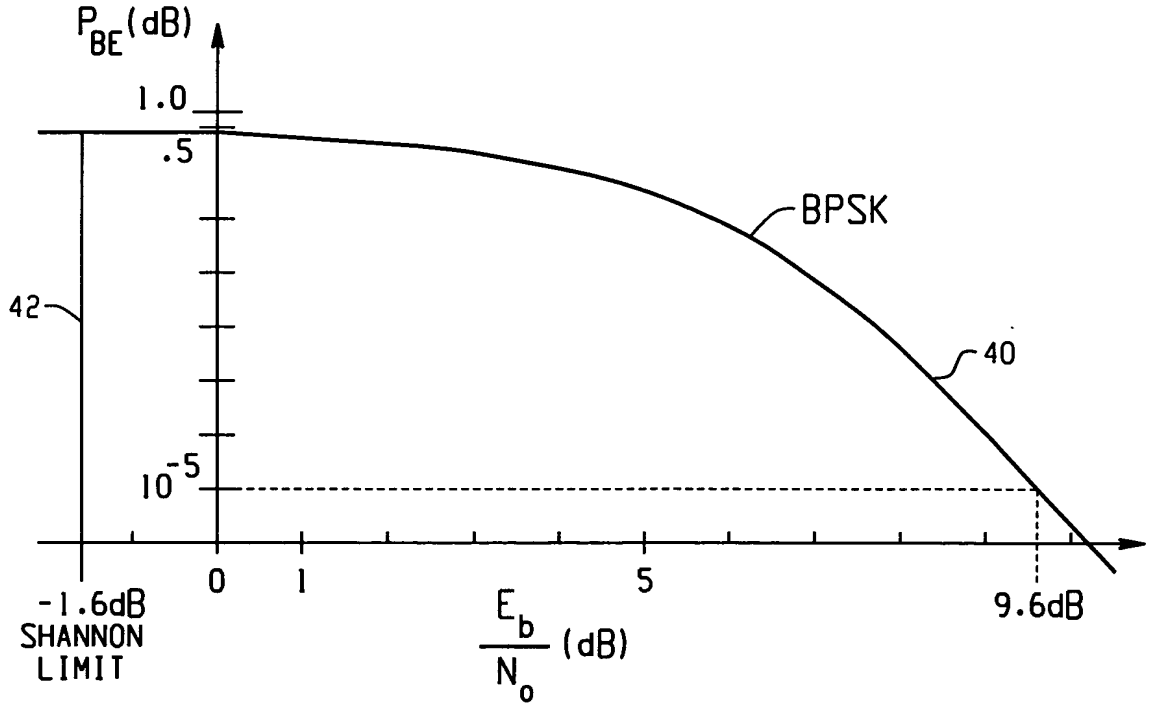

Fig. 2
PRIOR ART

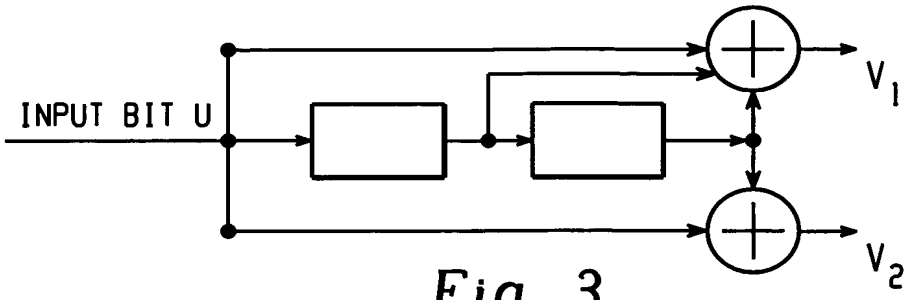

Fig. 3
PRIOR ART

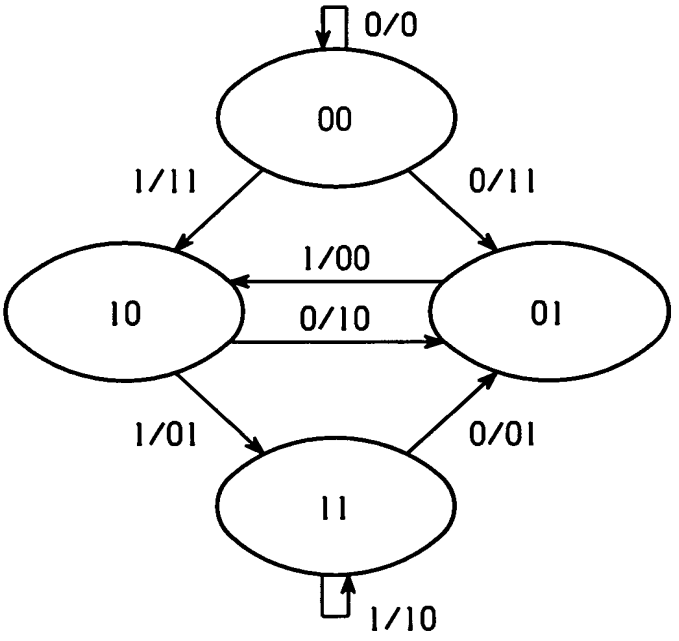

Fig. 4
PRIOR ART

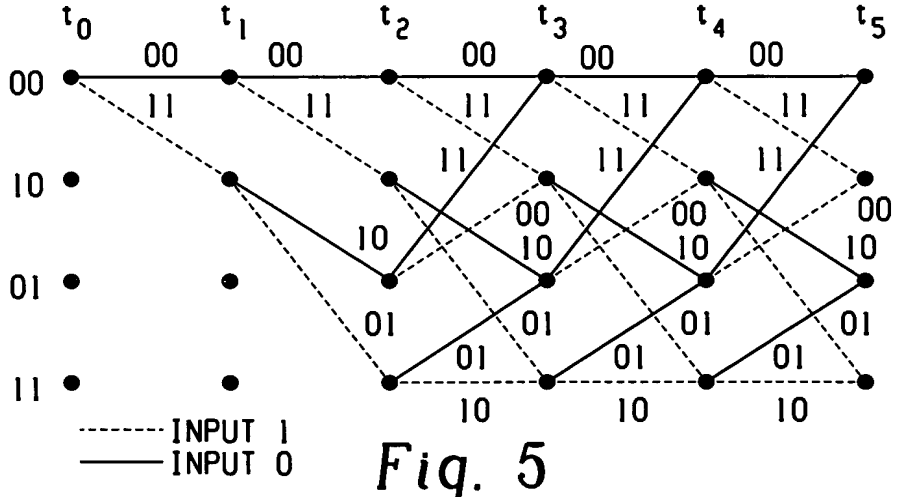

Fig. 5
PRIOR ART

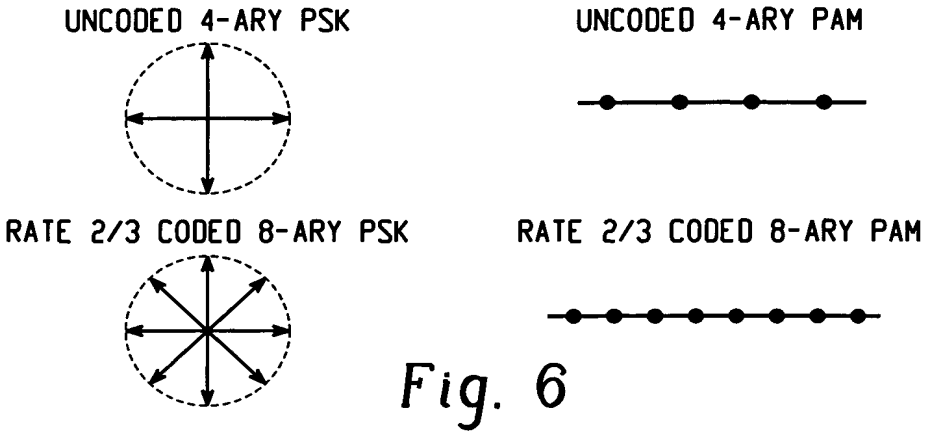

Fig. 6
PRIOR ART

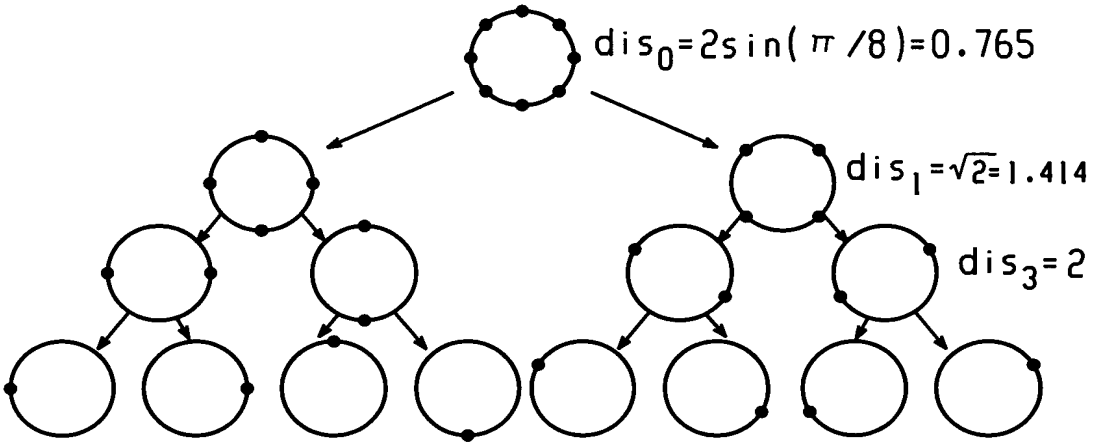

Fig. 7
PRIOR ART

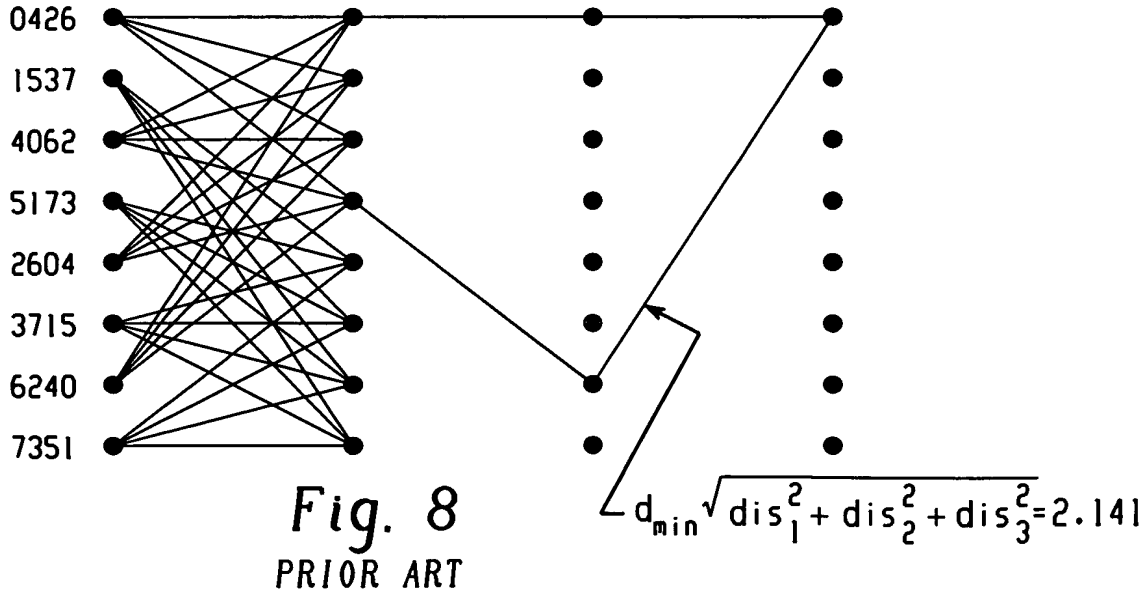

Fig. 8
PRIOR ART

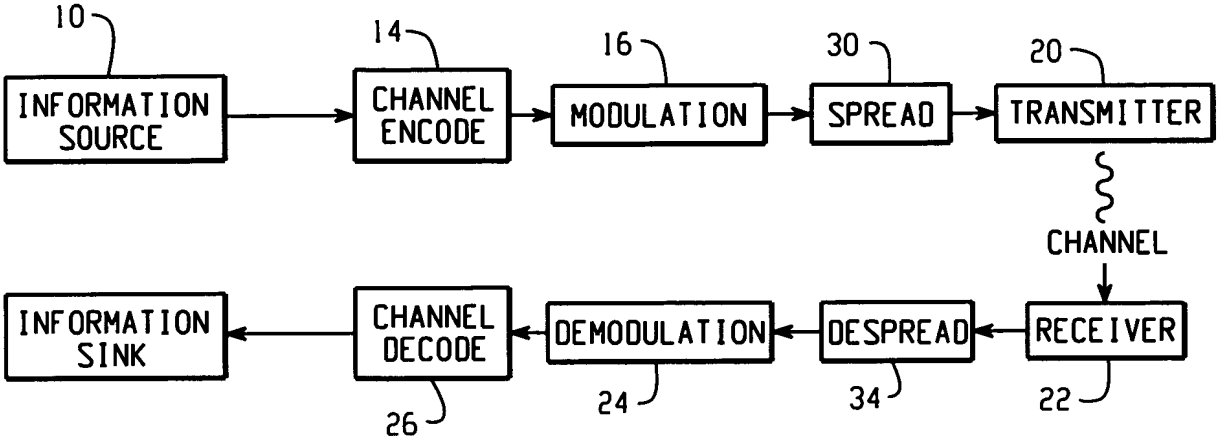

Fig. 1
PRIOR ART

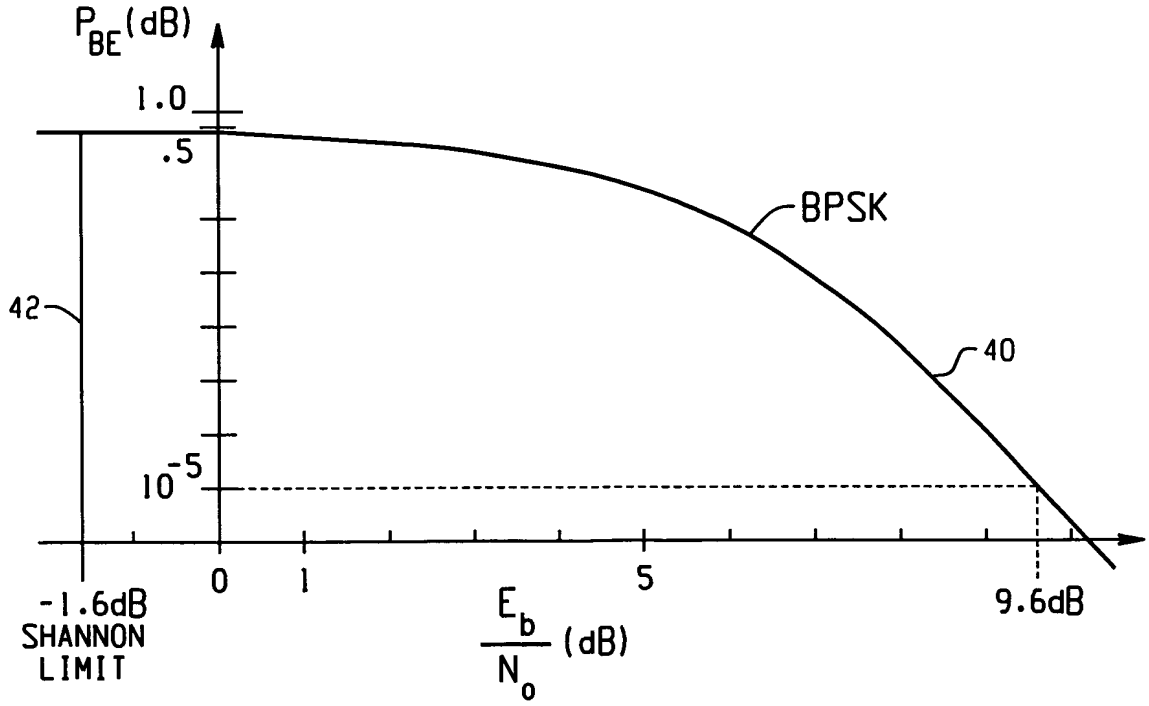

Fig. 2
PRIOR ART

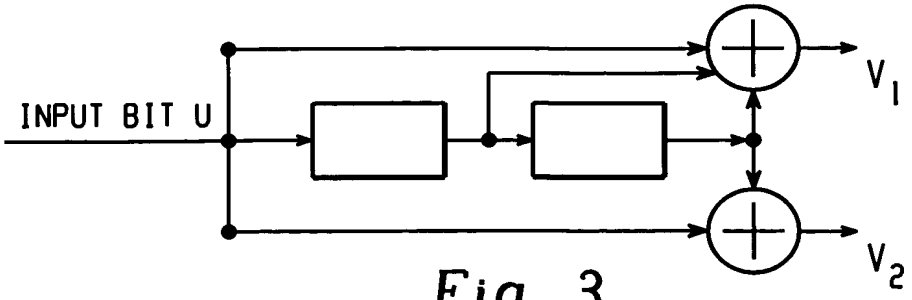

Fig. 3
PRIOR ART

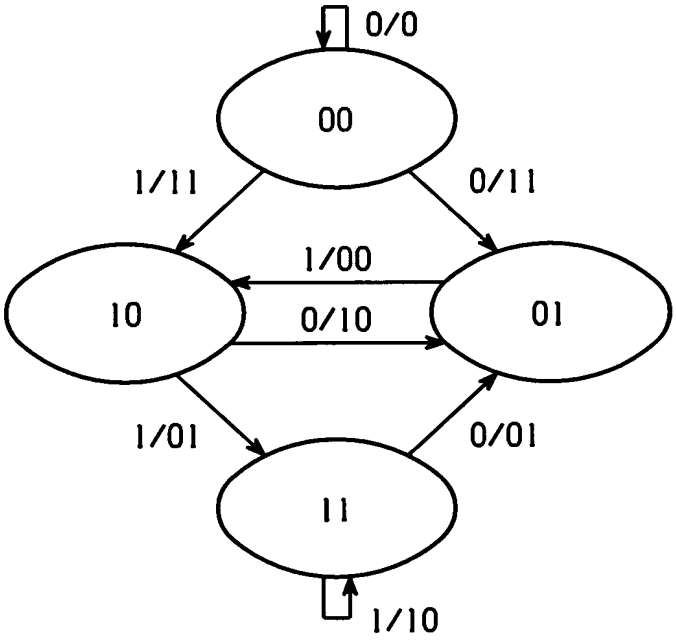

Fig. 4
PRIOR ART

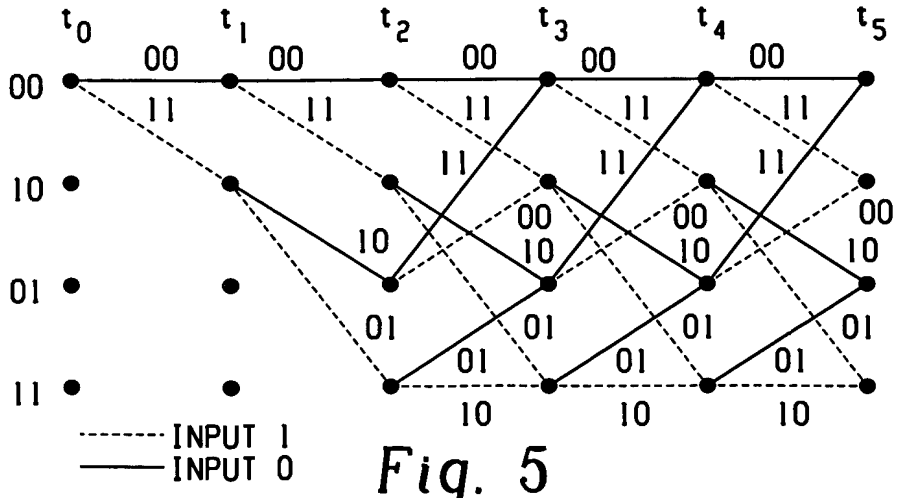

Fig. 5
PRIOR ART

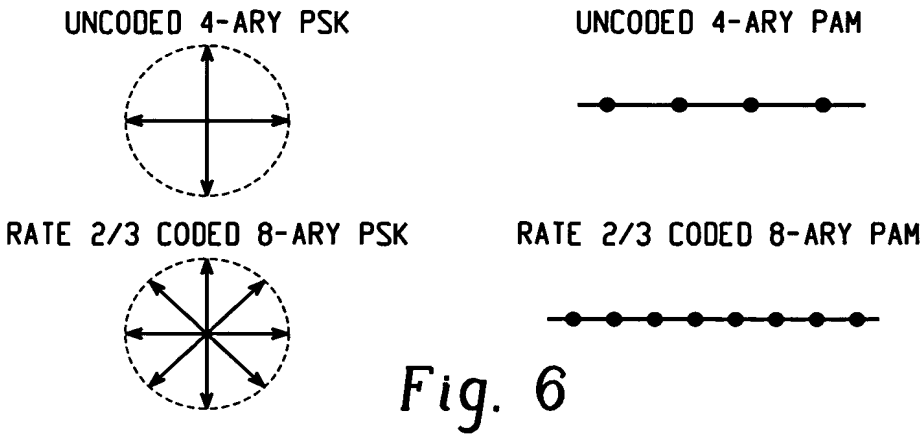

Fig. 6
PRIOR ART

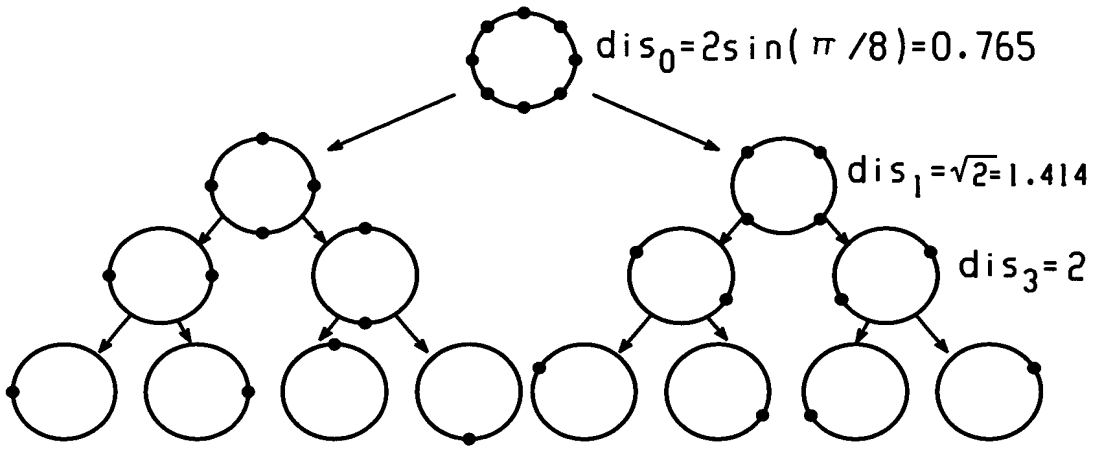

Fig. 7
PRIOR ART

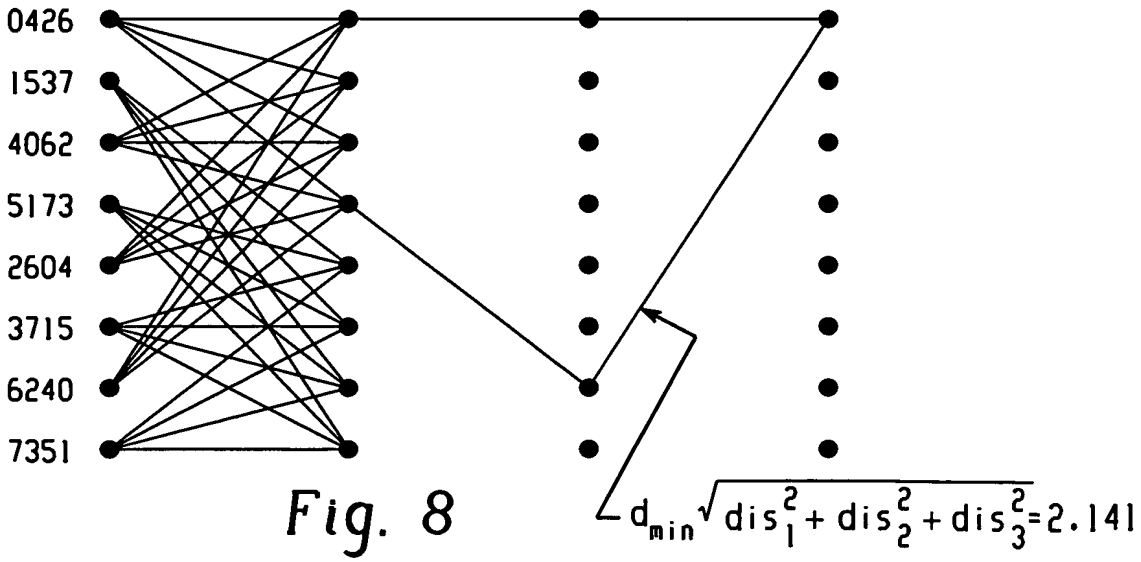

Fig. 8
PRIOR ART

TABLE 1 - STATE TRANSITION TABLE FOR CTCM (4,3)

STATE	INPUT 0	INPUT 1	INPUT 2	INPUT 3
1	1	2	5	34
2	3	8	15	37
3	4	14	10	50
4	5	34	1	2
5	6	26	11	47
6	7	64	17	25
7	8	3	37	15
8	9	28	29	20
9	10	50	4	14
10	11	47	6	26
11	12	63	31	62
12	13	27	53	55
13	14	4	50	10
14	15	37	3	8
15	16	54	30	43
16	17	25	7	64
17	18	35	40	51
18	19	49	57	42
19	20	29	28	9
20	21	58	38	56
21	22	61	52	24
22	23	44	32	48
23	24	52	61	22
24	25	17	64	7
25	26	6	47	11
26	27	13	55	53
27	28	9	20	29
28	29	20	9	28
29	30	43	16	54
30	31	62	12	63
31	32	48	23	44
32	33	36	46	39

STATE	INPUT 0	INPUT 1	INPUT 2	INPUT 3
33	34	5	2	1
34	35	18	51	40
35	36	33	39	46
36	37	15	8	3
37	38	56	21	58
38	39	46	36	33
39	40	51	18	35
40	41	45	59	60
41	42	57	49	19
42	43	30	54	16
43	44	23	48	32
44	45	41	60	59
45	46	39	33	36
46	47	11	26	6
47	48	32	44	23
48	49	19	42	57
49	50	10	14	4
50	51	40	35	18
51	52	24	22	61
52	53	55	13	27
53	54	16	43	30
54	55	53	27	13
55	56	38	58	21
56	57	42	19	49
57	58	21	56	38
58	59	60	41	45
59	60	59	45	41
60	61	22	24	52
61	62	31	63	12
62	63	12	62	31
63	64	7	25	17
64	2	1	34	5

Fig. 9

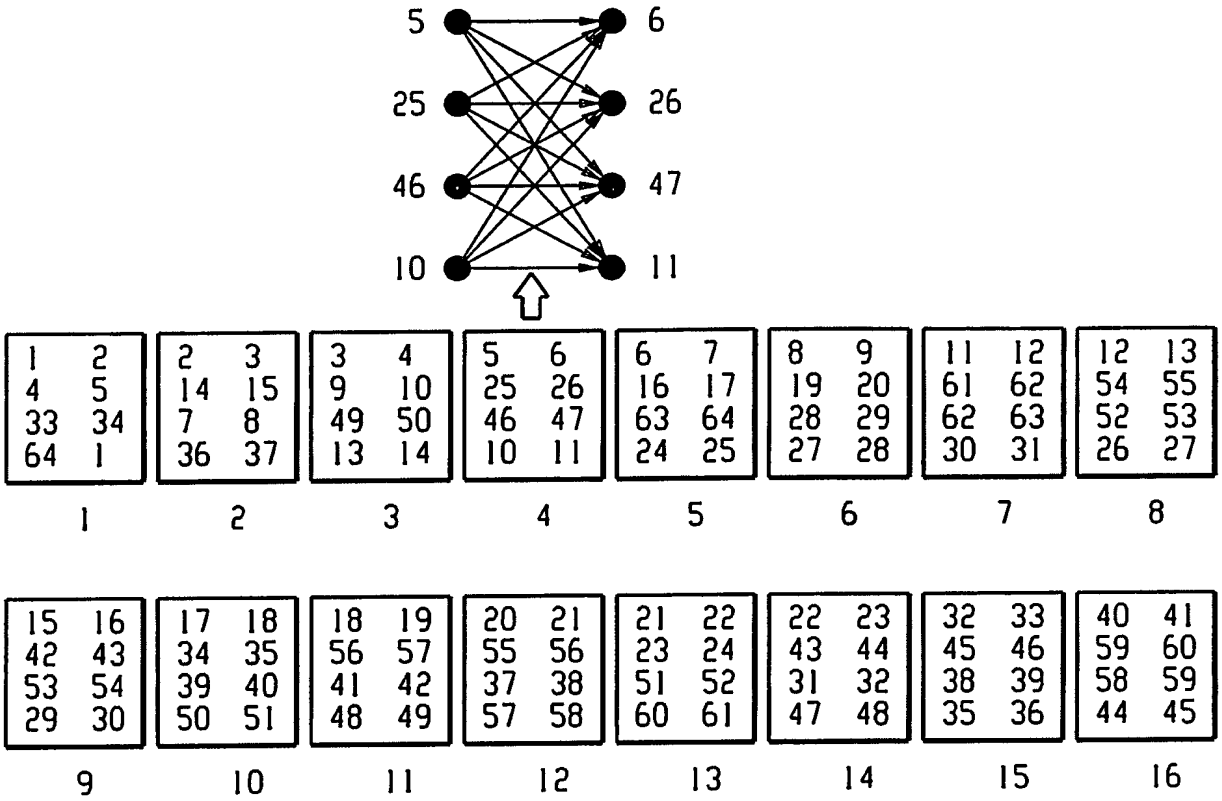
5
25
46
10
6
26
47
11
1 2 4 5 33 34 64 1
2 3 14 15 7 8 36 37
3 4 9 10 49 50 13 14
5 6 25 26 46 47 10 11
6 7 16 17 63 64 24 25
8 9 19 20 28 29 27 28
11 12 61 62 62 63 30 31
12 13 54 55 52 53 26 27
1
2
3
4
5
6
7
8
15 16 42 43 53 54 29 30
17 18 34 35 39 40 50 51
18 19 56 57 41 42 48 49
20 21 55 56 37 38 57 58
21 22 23 24 51 52 60 61
22 23 43 44 31 32 47 48
32 33 45 46 38 39 35 36
40 41 59 60 58 59 44 45
9
10
11
12
13
14
15
16

Fig. 10

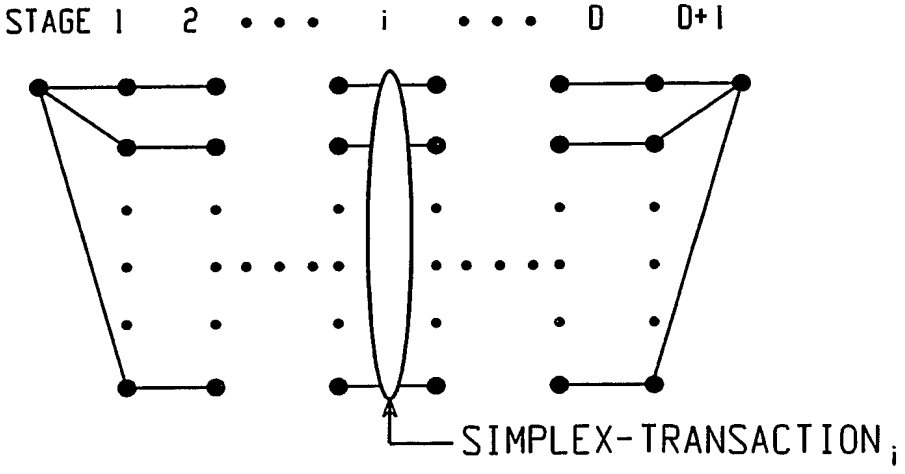
STAGE 1 2 • • • i • • • D D+1
SIMPLEX-TRANSACTION$_i$

Fig. 11

1	1	1	1	1
1	2	3	4	1
1	5	6	64	1
1	34	35	33	1
2	3	4	1	2
2	8	9	4	2
2	15	16	64	2
2	37	38	33	2
3	4	1	2	3
3	14	3	14	3
3	10	6	7	3
3	50	35	36	3
4	5	26	13	4
4	34	18	49	4
4	1	2	3	4
4	2	8	9	4
5	6	64	1	5
5	26	13	4	5
5	11	63	64	5
5	47	32	33	5
6	7	3	10	6
6	64	1	5	6
6	17	35	46	6
6	25	6	25	6
7	8	29	16	7
7	3	10	6	7
7	37	21	24	7
7	15	30	63	7
8	9	4	2	8
8	28	9	14	8
8	29	16	7	8
8	20	38	36	8
9	10	26	27	9
9	50	18	19	9
9	4	2	8	9
9	14	8	28	9
10	11	12	13	10
10	47	48	49	10

10	6	7	3	10
10	26	27	9	10
11	12	13	10	11
11	63	64	5	11
11	31	32	46	11
11	62	63	25	11
12	13	10	11	12
12	27	29	30	12
12	53	30	62	12
12	55	21	61	12
13	14	15	54	13
13	4	5	26	13
13	50	51	52	13
13	10	11	12	13
14	15	54	13	14
14	37	56	49	14
14	3	14	3	14
14	8	28	9	14
15	16	64	2	15
15	54	13	14	15
15	30	63	7	15
15	43	32	36	15
16	17	18	42	16
16	25	26	53	16
16	7	8	29	16
16	64	2	15	16
17	18	42	16	17
17	35	46	6	17
17	40	60	24	17
17	51	61	63	17
18	19	9	50	18
18	49	4	34	18
18	57	38	39	18
18	42	16	17	18
19	20	58	41	19
19	29	43	48	19
19	28	20	56	19
19	9	50	18	19

20	21	52	27	20
20	58	41	19	20
20	38	36	8	20
20	56	19	28	20
21	22	48	57	21
21	61	12	55	21
21	52	27	20	21
21	24	7	37	21
22	23	22	23	22
22	44	59	60	22
22	32	39	51	22
22	48	57	21	22
23	24	25	47	23
23	52	53	43	23
23	61	62	31	23
23	22	23	22	23
24	25	47	23	24
24	17	40	60	24
24	64	34	51	24
24	7	37	21	24
25	26	53	16	25
25	6	25	6	25
25	47	23	24	25
25	11	62	63	25
26	27	9	10	26
26	13	4	5	26
26	55	38	46	26
26	53	16	25	26
27	28	29	54	27
27	9	10	26	27
27	20	21	52	27
27	29	30	12	27
28	29	54	27	28
28	20	56	19	28
28	9	14	8	28
28	28	28	28	28
29	30	12	27	29
29	43	48	19	29

Fig. 12A

29	16	7	8	29
29	54	27	28	29
30	31	48	42	30
30	62	12	53	30
30	12	27	29	30
30	63	7	15	30
31	32	46	11	31
31	48	42	30	31
31	23	61	62	31
31	44	60	61	31
32	33	5	47	32
32	36	15	43	32
32	46	11	31	32
32	39	51	22	32
33	34	40	45	33
33	5	47	32	33
33	2	37	38	33
33	1	34	35	33
34	35	33	1	34
34	18	49	4	34
34	51	24	64	34
34	40	45	33	34
35	36	3	50	35
35	33	1	34	35
35	39	35	39	35
35	46	6	17	35
36	37	58	45	36
36	15	43	32	36
36	8	20	38	36
36	3	50	35	36
37	38	33	2	37
37	56	49	14	37
37	21	24	7	37
37	58	45	36	37
38	39	18	57	38
38	46	26	55	38
38	36	8	20	38
38	33	2	37	38

39	40	59	45	39
39	51	22	32	39
39	18	57	38	39
39	35	39	35	39
40	41	49	50	40
40	45	33	34	40
40	59	45	39	40
40	60	24	17	40
41	42	43	44	41
41	57	58	59	41
41	49	50	40	41
41	19	20	58	41
42	43	44	41	42
42	30	31	48	42
42	54	55	56	42
42	16	17	18	42
43	44	41	42	43
43	23	52	53	43
43	48	19	29	43
43	32	36	15	43
44	45	46	47	44
44	41	42	43	44
44	60	61	31	44
44	59	60	22	44
45	46	47	44	45
45	39	40	59	45
45	33	34	40	45
45	36	37	58	45
46	47	44	45	33
46	11	31	32	34
46	26	55	38	34
46	6	17	35	34
47	48	49	10	34
47	32	33	5	35
47	44	45	46	35
47	23	24	25	35
48	49	10	47	35
48	19	29	43	36

Fig. 12B

48	42	30	31	36
48	57	21	22	36
49	50	40	41	36
49	10	47	48	37
49	14	37	56	37
49	4	34	18	37
50	51	52	13	37
50	40	41	49	38
50	35	36	3	38
50	18	19	9	38
51	52	13	50	38
51	24	64	34	39
51	22	32	39	39
51	61	63	17	39
52	53	43	23	39
52	55	58	60	40
52	13	50	51	40
52	27	20	21	40
53	54	53	54	40
53	16	25	26	41
53	43	23	52	41
53	30	62	12	41
54	55	56	42	41
54	53	54	53	42
54	27	28	29	42
54	13	14	15	42
55	56	42	54	42
55	38	46	26	43
55	58	60	52	43
55	21	61	12	43
56	57	56	57	43
56	42	54	55	44
56	19	28	20	44
56	49	14	37	44
57	58	59	41	44
57	21	22	48	45
57	56	57	56	45
57	38	39	18	45

58	59	41	57	45
58	60	52	55	33
58	41	19	20	34
58	45	36	37	34
59	60	22	44	34
59	59	59	59	34
59	45	39	40	35
59	41	57	58	35
60	61	31	44	35
60	22	44	59	35
60	24	17	40	36
60	52	55	58	36
61	62	31	23	36
61	31	44	60	36
61	63	17	51	37
61	12	55	21	37
62	63	25	11	37
62	12	53	30	37
62	62	62	62	38
62	31	23	61	38
63	64	5	11	38
63	7	15	30	38
63	25	11	62	39
63	17	51	61	39
64	2	15	16	39
64	1	5	6	39
64	34	51	24	40
64	5	11	63	40

Fig. 12C

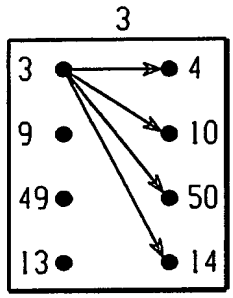

Fig. 13(a)

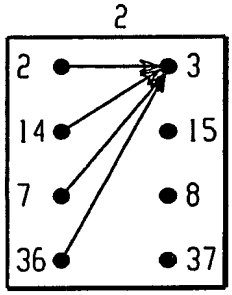

Fig. 13(b)

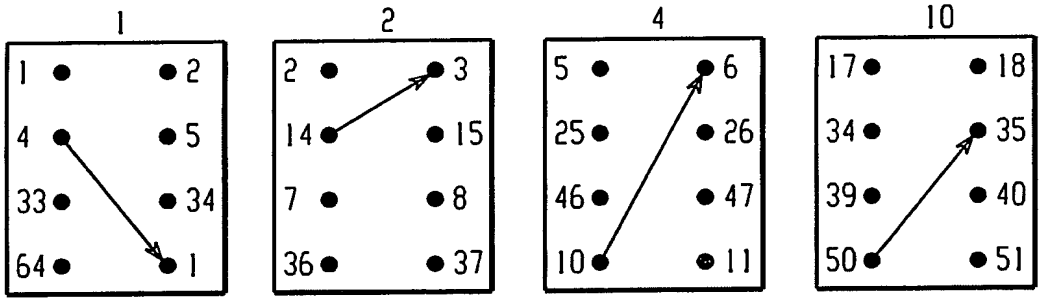

Fig. 13(c)

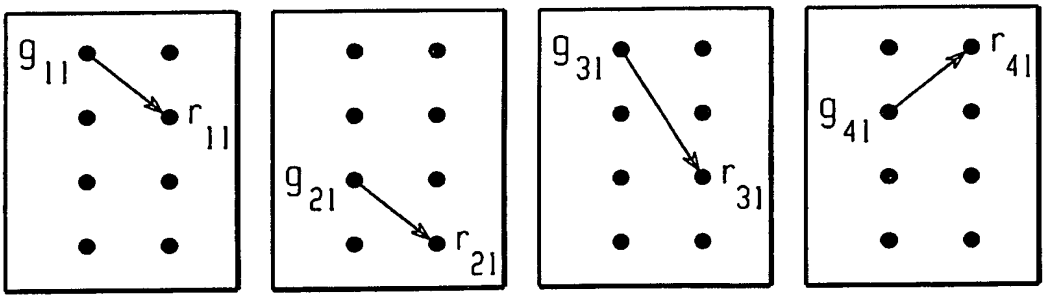

Fig. 14(a)

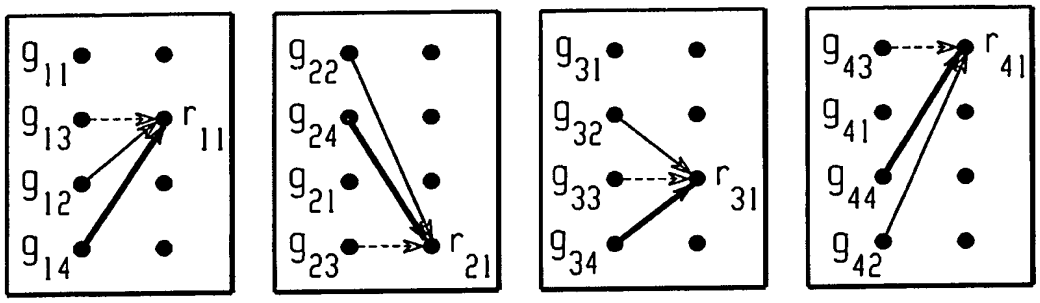

Fig. 14(b)

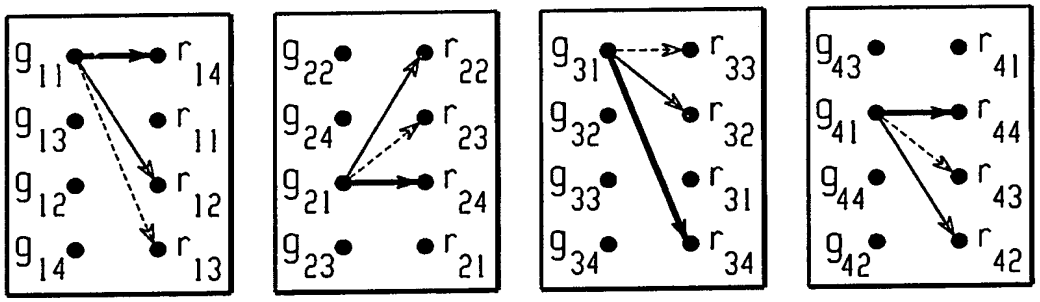

Fig. 14(c)

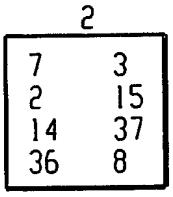

Fig. 15(a)

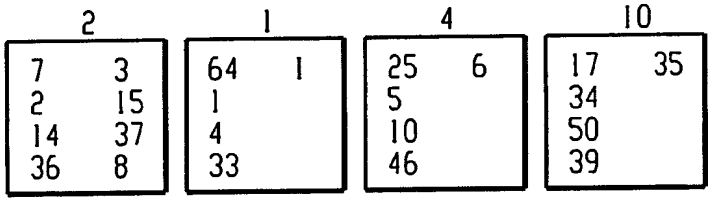

Fig. 15(b)

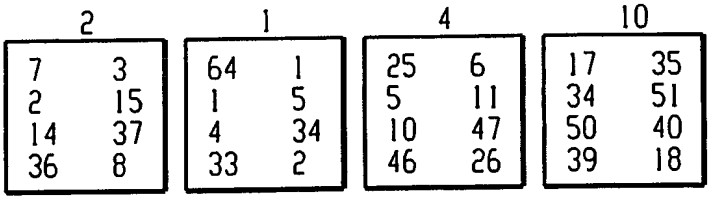

Fig. 15(c)

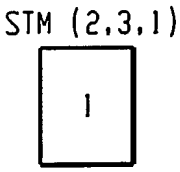

Fig. 16(a)

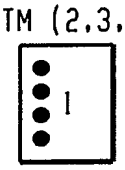

Fig. 16(b)

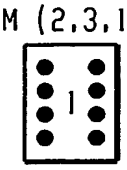

Fig. 16(c)

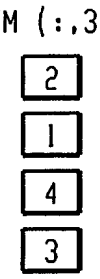

Fig. 16(d)

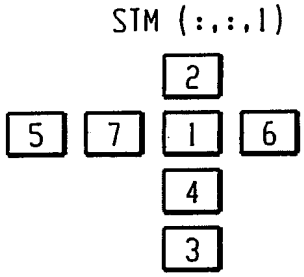

Fig. 16(e)

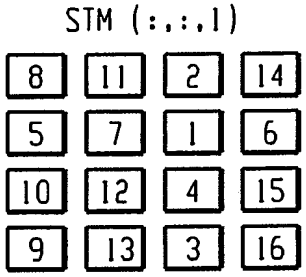

Fig. 16(f)

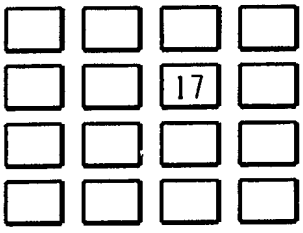

Fig. 16(g)

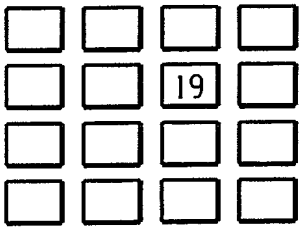

Fig. 16(h)

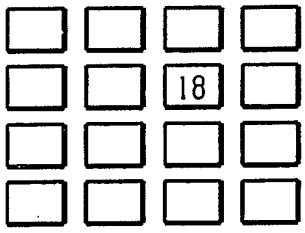

Fig. 16(i)

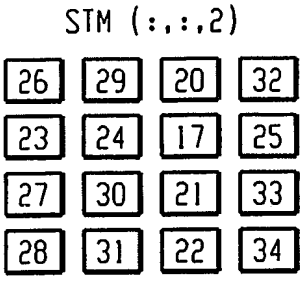

Fig. 16(j)

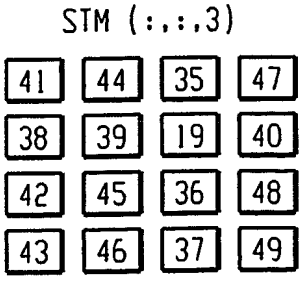

Fig. 16(k)

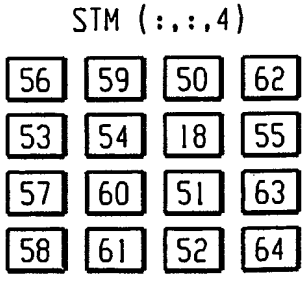

Fig. 16(l)

STM (2,3)

1	1
64	2
4	5
33	34

Fig. 17(a)

STM (:,3)

2	3
7	8
14	15
36	37

1	1
64	2
4	5
33	34

34	35
17	18
50	51
39	40

5	6
25	26
10	11
46	47

Fig. 17(b)

STM (:,:)

2	3
7	8
14	15
36	37

6	64
63	7
16	25
24	17

3	4
13	14
9	10
49	50

1	1
64	2
4	5
33	34

35	33
32	36
38	46
45	39

34	35
17	18
50	51
39	40

5	6
25	26
10	11
46	47

Fig. 17(c)

26	13
12	27
54	53
52	55

8	9
27	28
28	29
19	20

2	3
7	8
14	15
36	37

18	49
48	19
56	42
41	57

6	64
63	7
16	25
24	17

3	4
13	14
9	10
49	50

1	1
64	2
4	5
33	34

35	33
32	36
38	46
45	39

47	32
31	48
43	23
22	44

37	38
55	56
20	21
57	58

34	35
17	18
50	51
39	40

40	45
44	41
58	60
59	59

11	63
62	12
30	62
61	31

15	16
53	54
29	30
42	43

5	6
25	26
10	11
46	47

51	24
23	52
21	61
60	22

Fig. 17(d)

```
 1  2  3      1  2 -3
 1 -2 -3      1 -2  3
-1  2 -3     -1  2  3
-1 -2  3     -1 -2 -3
```

Fig. 18

```
 1  3  5
-1  4  6
 2 -3 -6
-2 -4 -5
```

Fig. 19(a)

```
 1  3  5    1 -3 -5   -1  3 -5   -1 -3  5
-1  4  6   -1 -4 -6    1  4 -6    1 -4  6
 2 -3 -6    2  3  6   -2 -3  6   -2  3 -6
-2 -4 -5   -2  4  5    2 -4  5    2  4 -5
   (1)        (2)        (3)        (4)
```

Fig. 19(b)

(1,3,5), (1,-3,-5), (-1,3,-5), (-1,-3,5)
(-1,4,6), (-1,-4,-6), (1,4,-6), (1,-4,6)
(2,-3,-6), (2,3,6), (-2,-3,6), (-2,3,-6)
(-2,-4,-5), (-2,4,5), (2,-4,5), (2,4,-5)

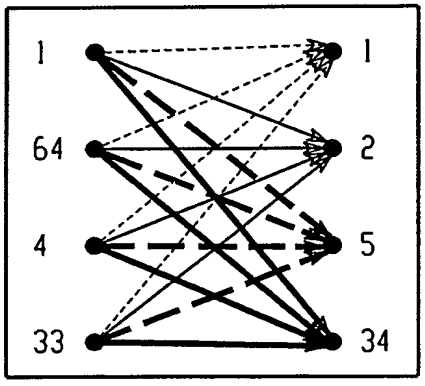

Fig. 20(a)

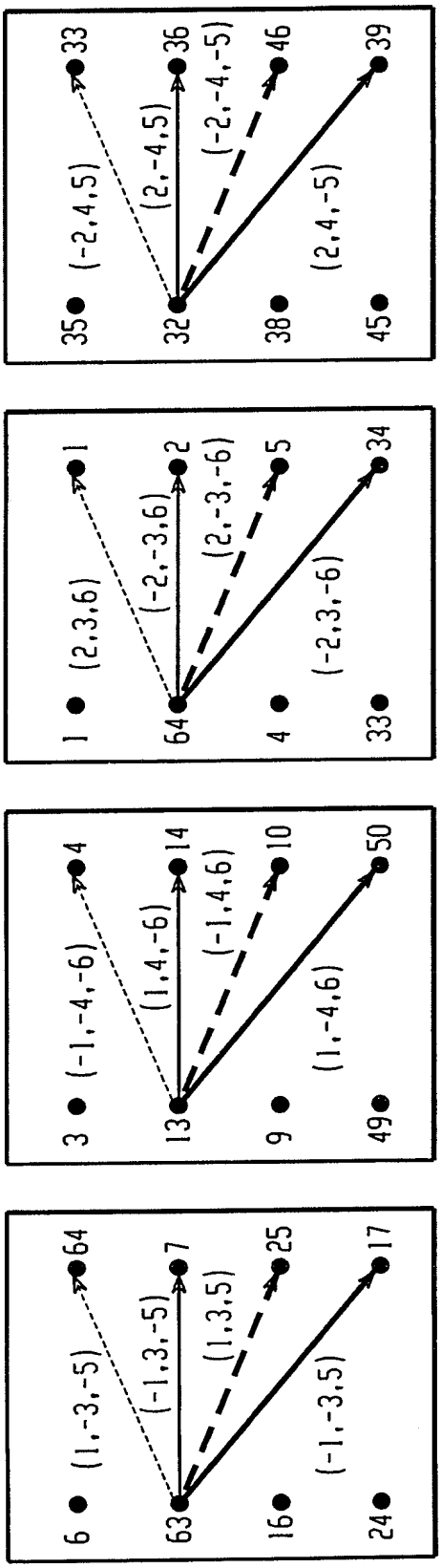
33
36
46
39
35
(-2,4,5)
(2,-4,5)
(-2,-4,-5)
(2,4,-5)
32
38
45
1
2
5
34
1
(2,3,6)
(-2,-3,6)
(2,-3,-6)
(-2,3,-6)
64
4
33
4
14
10
50
3
(-1,-4,-6)
(1,4,-6)
(-1,4,6)
(1,-4,6)
13
9
49
64
7
25
17
6
(1,-3,-5)
(-1,3,-5)
(1,3,5)
(-1,-3,5)
63
16
24

Fig. 20 (b)

1	3	5

Fig. 21(a)

1	3	5
-1		
	-3	
		-5

Fig. 21(b)

1	3	5
-1	4	6
2	-3	-6
-2	-4	-5

Fig. 21(c)

IIS(:,1,1)

1	3	5
-1	4	6
2	-3	-6
-2	-4	-5

Fig. 22(a)

IIS(:,1,1)

1	3	5
-1	4	6
2	-3	-6
-2	-4	-5
-1		
1		
-2		
2		
	-3	
	-4	
	3	
	4	
		-5
		-6
		6
		5

Fig. 22(b)

IIS(:,1,1)

1	3	5
-1	4	6
2	-3	-6
-2	-4	-5
-1	9	11
1	10	12
-2	-9	-12
2	-10	-11
7	-3	-11
-7	-4	-12
8	3	12
-8	4	11
-7	-9	-5
7	-10	-6
-8	9	6
8	10	5

Fig. 22(c)

IIS(:,:,1)

1 3 5 -1 4 6 2 -3 -6 -2 -4 -5	-1 1 -2 2	-3 -4 3 4	-5 -6 6 5
-1 9 11 1 10 12 -2 -9 -12 2 -10 -11	1 -1 2 -2	-9 -10 9 10	-11 -12 12 11
7 -3 -11 -7 -4 -12 8 3 12 -8 4 11	-7 7 -8 8	3 4 -3 -4	11 12 -12 -11
-7 -9 -5 7 -10 -6 -8 9 6 8 10 5	7 -7 8 -8	9 10 -9 -10	5 6 -6 -5

Fig. 22(d)

IIS(:,:,1)

1 3 5 -1 4 6 2 -3 -6 -2 -4 -5	-1 17 21 1 18 22 -2 -17 -22 2 -18 -21	13 -3 -21 -13 -4 -22 14 3 22 -14 4 21	-13 -17 -5 13 -18 -6 -14 17 6 14 18 5
-1 9 11 1 10 12 -2 -9 -12 2 -10 -11	1 19 23 -1 20 24 2 -19 -24 -2 -20 -23	-13 -9 -23 13 -10 -24 -14 9 24 14 10 23	13 -19 -11 -13 -20 -12 14 19 12 -14 20 11
7 -3 -11 -7 -4 -12 8 3 12 -8 4 11	-7 -17 -23 7 -18 -24 -8 17 24 8 18 23	15 3 23 -15 4 24 16 -3 -24 -16 -4 -23	-15 17 11 15 18 12 -16 -17 -12 16 -18 -11
-7 -9 -5 7 -10 -6 -8 9 6 8 10 5	7 -19 -21 -7 -20 -22 8 19 22 -8 20 21	-15 9 21 15 10 22 -16 -9 -22 16 -10 -21	15 19 5 -15 20 6 16 -19 -6 -16 -20 -5

Fig. 22(e)

IIS(:,:,3)

-3	-17	3	17
-4	-18	4	18
3	17	-3	-17
4	18	-4	-18
-9	-19	9	19
-10	-20	10	20
9	19	-9	-19
10	20	-10	-20
3	17	-3	-17
4	18	-4	-18
-3	-17	3	17
-4	-18	4	18
9	19	-9	-19
10	20	-10	-20
-9	-19	9	19
-10	-20	10	20

Fig. 22(g)

IIS(:,:,2)

-1	1	-13	13
1	-1	13	-13
-2	2	-14	14
2	-2	14	-14
1	-1	13	-13
-1	1	-13	13
2	-2	14	-14
-2	2	-14	14
-7	7	-15	15
7	-7	15	-15
-8	8	-16	16
8	-8	16	-16
7	-7	15	-15
-7	7	-15	15
8	-8	16	-16
-8	8	-16	16

Fig. 22(f)

IIS(:,:,4)

-5	-21	21	5
-6	-22	22	6
6	22	-22	-6
5	21	-21	-5
-11	-23	23	11
-12	-24	24	12
12	24	-24	-12
11	23	-23	-11
11	23	-23	-11
12	24	-24	-12
-12	-24	24	12
-11	-23	23	11
5	21	-21	-5
6	22	-22	-6
-6	-22	22	6
-5	-21	21	5

Fig. 22(h)

IIS(:,:,2)

-1	33	41	1	37	45	-13	-33	-45	13	-37	-41
1	34	42	-1	38	46	13	-34	-46	-13	-38	-42
-2	-33	-42	2	-37	-46	-14	33	46	14	37	42
2	-34	-41	-2	-38	-45	14	34	45	-14	38	41
1	35	43	-1	39	47	13	-35	-47	-13	-39	-43
-1	36	44	1	40	48	-13	-36	-48	13	-40	-44
2	-35	-44	-2	-39	-48	14	35	48	-14	39	44
-2	-36	-43	2	-40	-47	-14	36	47	14	40	43
-7	-33	-43	7	-37	-47	-15	33	47	15	37	43
7	-34	-44	-7	-38	-48	15	34	48	-15	38	44
-8	33	44	8	37	48	-16	-33	-48	16	-37	-44
8	34	43	-8	38	47	16	-34	-47	-16	-38	-43
7	-35	-41	-7	-39	-45	15	35	45	-15	39	41
-7	-36	-42	7	-40	-46	-15	36	46	15	40	42
8	35	42	-8	39	46	16	-35	-46	-16	-39	-42
-8	36	41	8	40	45	-16	-36	-45	16	-40	-41

Fig. 22(i)

IIS(:,:,3)

25	-3	-41	-25	-17	-45	29	3	45	-29	17	41
-25	-4	-42	25	-18	-46	-29	4	46	29	18	42
26	3	42	-26	17	46	30	-3	-46	-30	-17	-42
-26	4	41	26	18	45	-30	-4	-45	30	-18	-41
-25	-9	-43	25	-19	-47	-29	9	47	29	19	43
25	-10	-44	-25	-20	-48	29	10	48	-29	20	44
-26	9	44	26	19	48	-30	-9	-48	30	-19	-44
26	10	43	-26	20	47	30	-10	-47	-30	-20	-43
27	3	43	-27	17	47	31	-3	-47	-31	-17	-43
-27	4	44	27	18	48	-31	-4	-48	31	-18	-44
28	-3	-44	-28	-17	-48	32	3	48	-32	17	44
-28	-4	-43	28	-18	-47	-32	4	47	32	18	43
-27	9	41	27	19	45	-31	-9	-45	31	-19	-41
27	10	42	-27	20	46	31	-10	-46	-31	-20	-42
-28	-9	-42	28	-19	-46	-32	9	46	32	19	42
28	-10	-41	-28	-20	-45	32	10	45	-32	20	41

Fig. 22(j)

IIS(:,:,4)

-25	-33	-5	25	-37	-21	-29	33	21	29	37	5
25	-34	-6	-25	-38	-22	29	34	22	-29	38	6
-26	33	6	26	37	22	-30	-33	-22	30	-37	-6
26	34	5	-26	38	21	30	-34	-21	-30	-38	-5
25	-35	-11	-25	-39	-23	29	35	23	-29	39	11
-25	-36	-12	25	-40	-24	-29	36	24	29	40	12
26	35	12	-26	39	24	30	-35	-24	-30	-39	-12
-26	36	11	26	40	23	-30	-36	-23	30	-40	-11
-27	33	11	27	37	23	-31	-33	-23	31	-37	-11
27	34	12	-27	38	24	31	-34	-24	-31	-38	-12
-28	-33	-12	28	-37	-24	-32	33	24	32	37	12
28	-34	-11	-28	-38	-23	32	34	23	-32	38	11
27	35	5	-27	39	21	31	-35	-21	-31	-39	-5
-27	36	6	27	40	22	-31	-36	-22	31	-40	-6
28	-35	-6	-28	-39	-22	32	35	22	-32	39	6
-28	-36	-5	28	-40	-21	-32	36	21	32	40	5

Fig. 22(k)

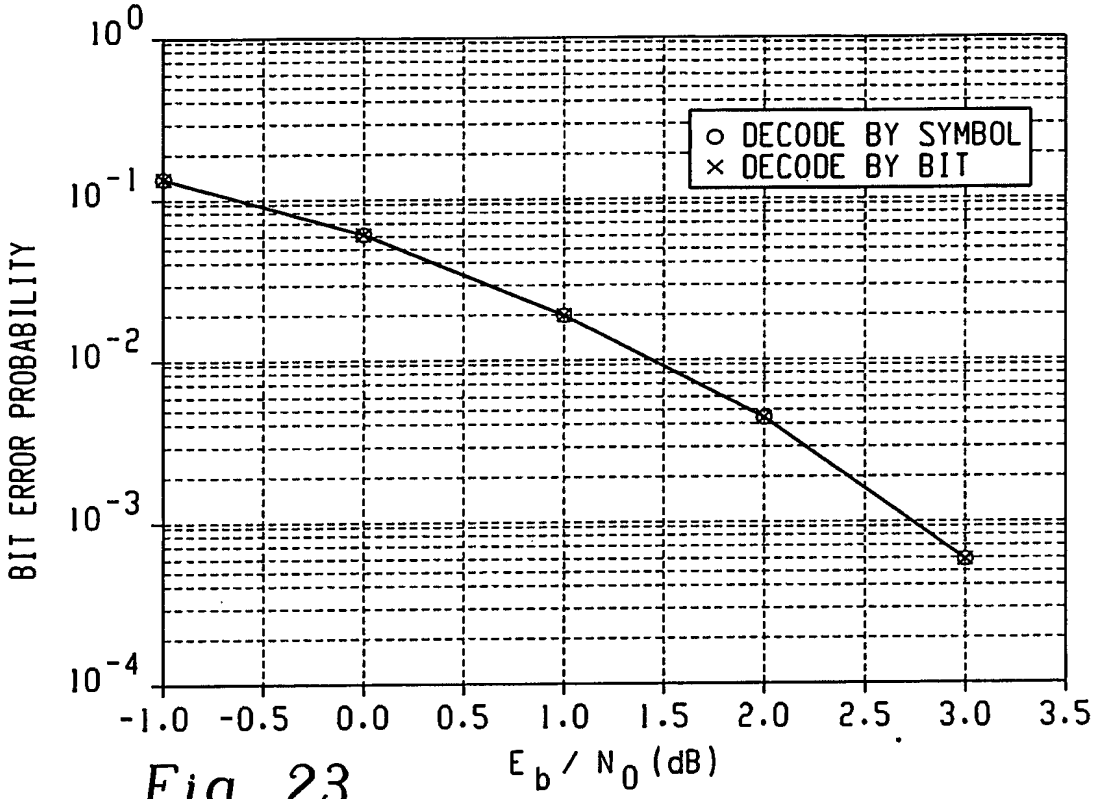
BIT ERROR PROBABILITY
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
-1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5
E_b / N_0 (dB)
o DECODE BY SYMBOL
× DECODE BY BIT

Fig. 23

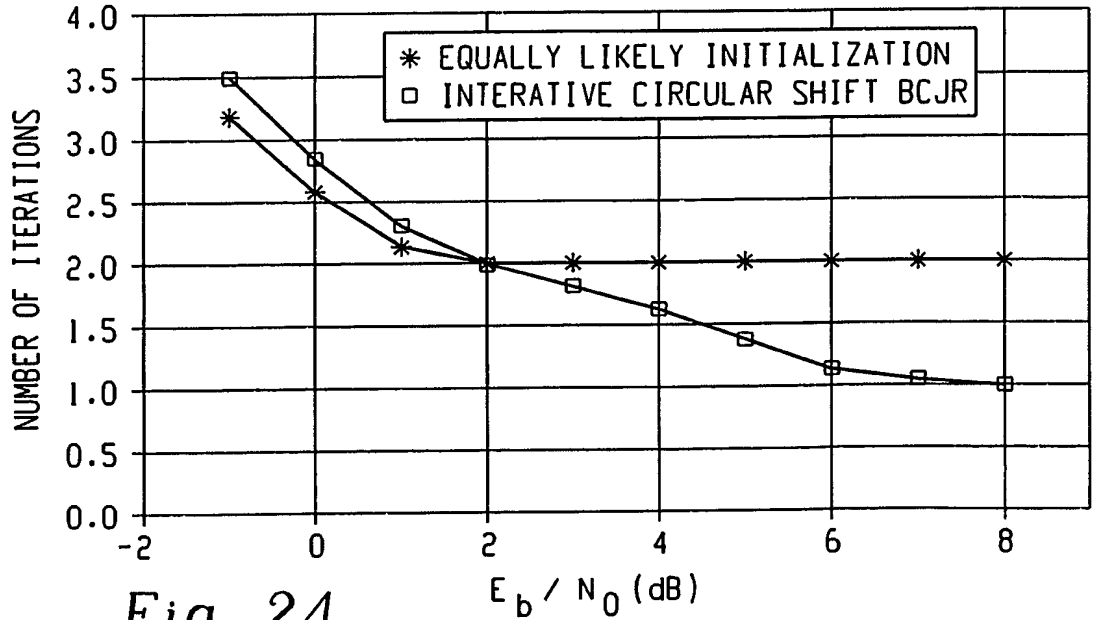
NUMBER OF ITERATIONS
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-2 0 2 4 6 8
E_b / N_0 (dB)
* EQUALLY LIKELY INITIALIZATION
□ INTERATIVE CIRCULAR SHIFT BCJR

Fig. 24

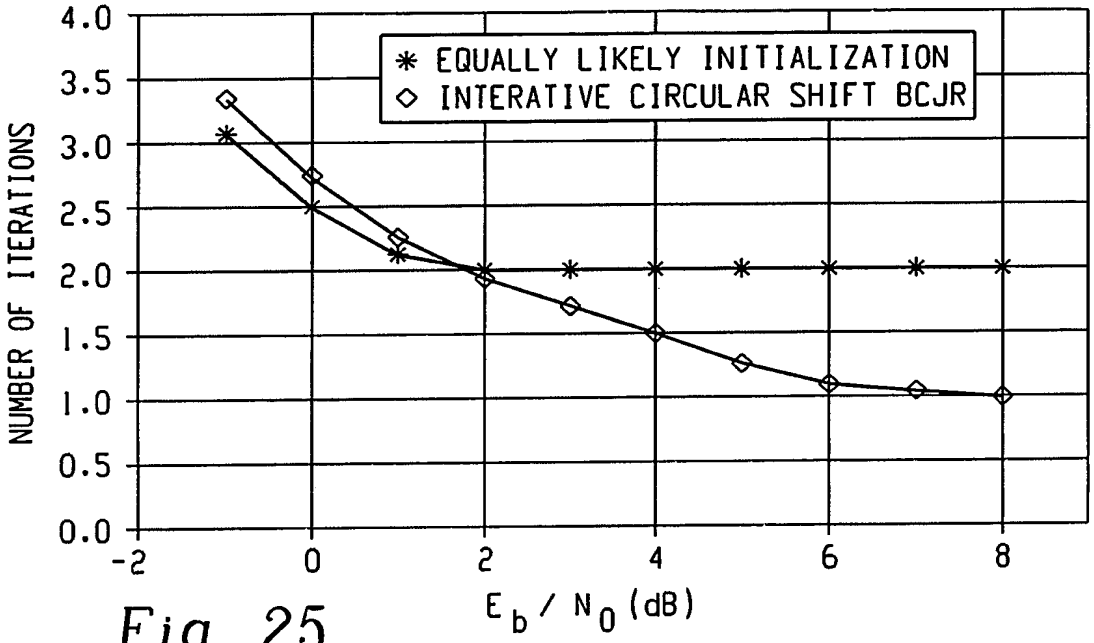
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
NUMBER OF ITERATIONS
* EQUALLY LIKELY INITIALIZATION
◇ INTERATIVE CIRCULAR SHIFT BCJR
-2
0
2
4
6
8
E_b / N_0 (dB)

Fig. 25

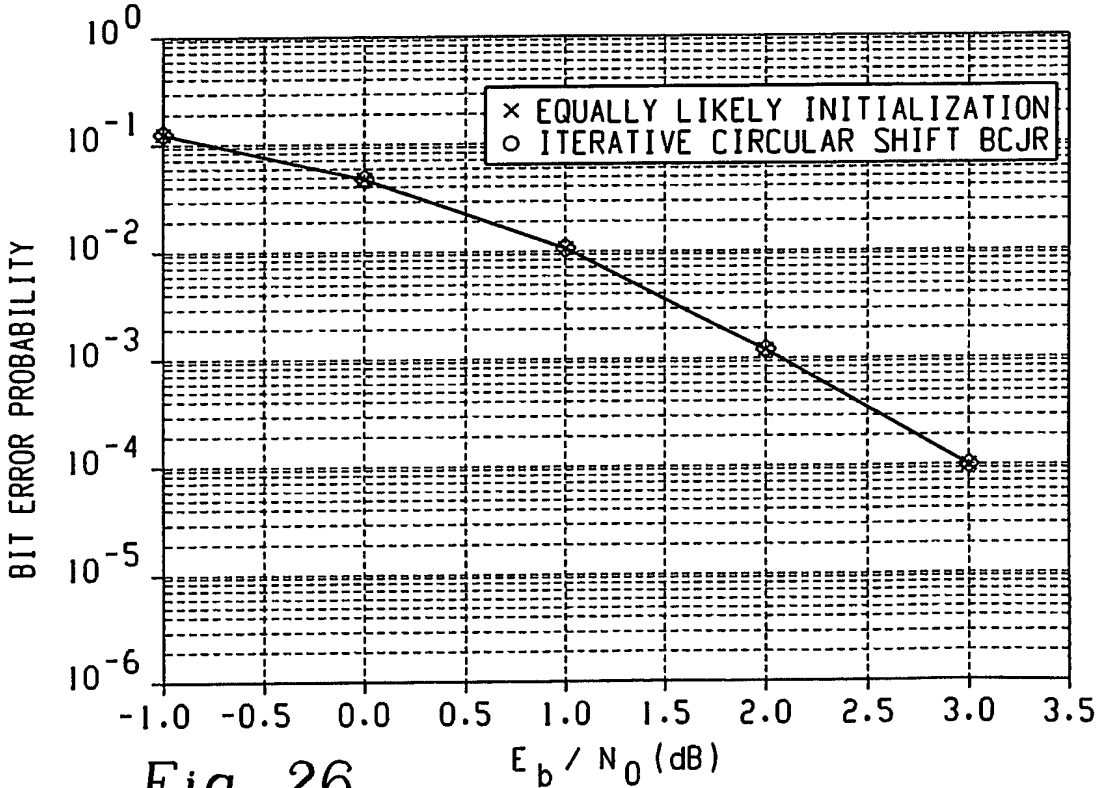
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
BIT ERROR PROBABILITY
× EQUALLY LIKELY INITIALIZATION
o ITERATIVE CIRCULAR SHIFT BCJR
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
E_b / N_0 (dB)

Fig. 26

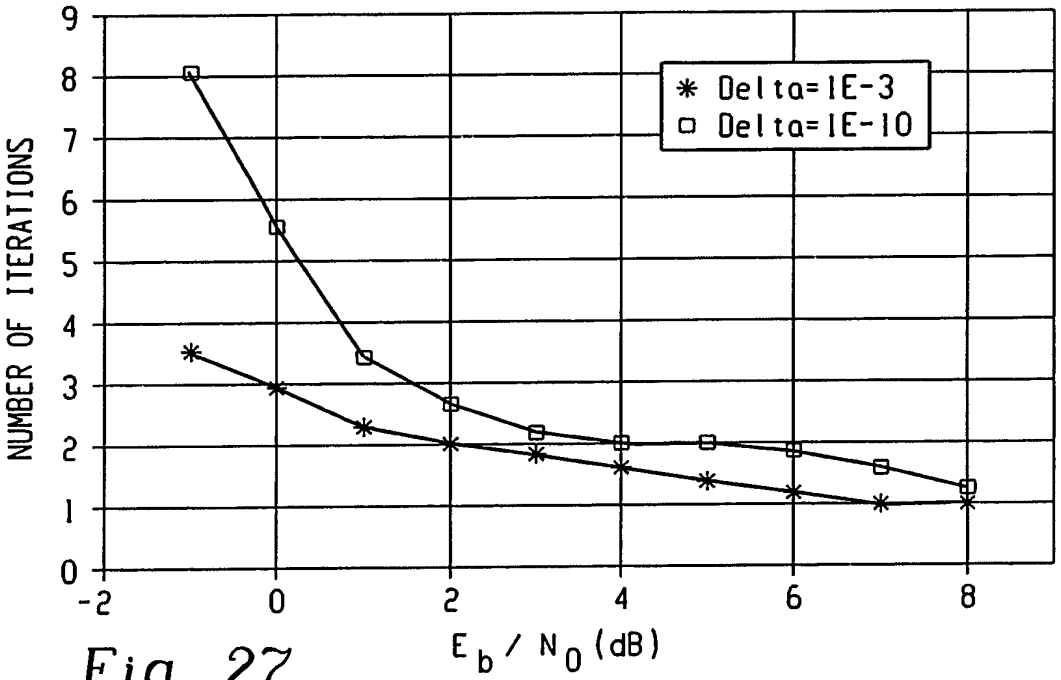
NUMBER OF ITERATIONS
0
1
2
3
4
5
6
7
8
9
-2
0
2
4
6
8
E_b / N_0 (dB)
* Delta=1E-3
□ Delta=1E-10

Fig. 27

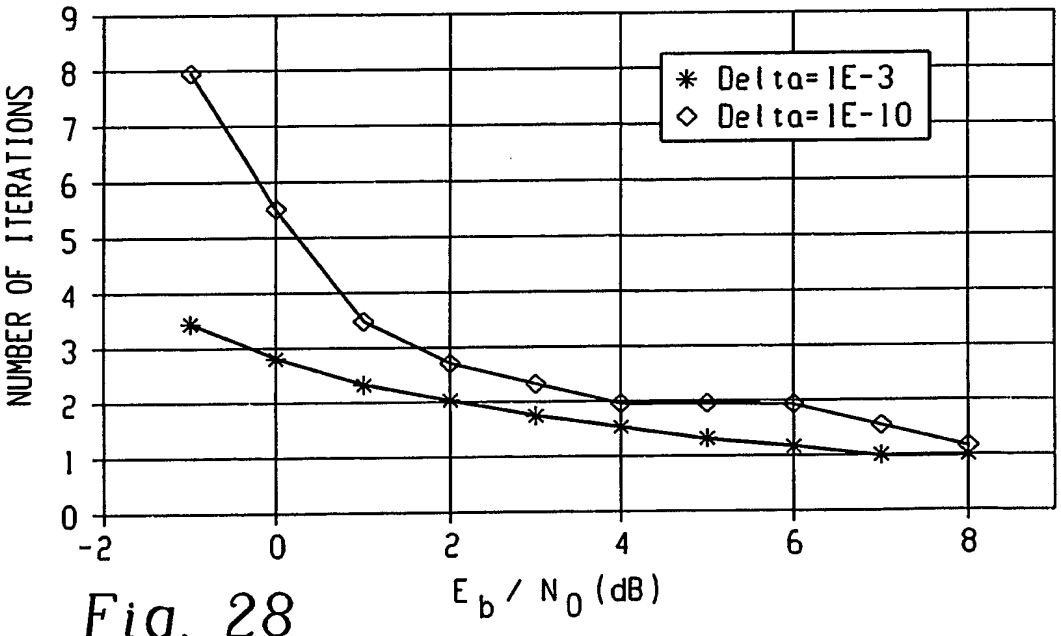
NUMBER OF ITERATIONS
0
1
2
3
4
5
6
7
8
9
-2
0
2
4
6
8
E_b / N_0 (dB)
* Delta=1E-3
◇ Delta=1E-10

Fig. 28

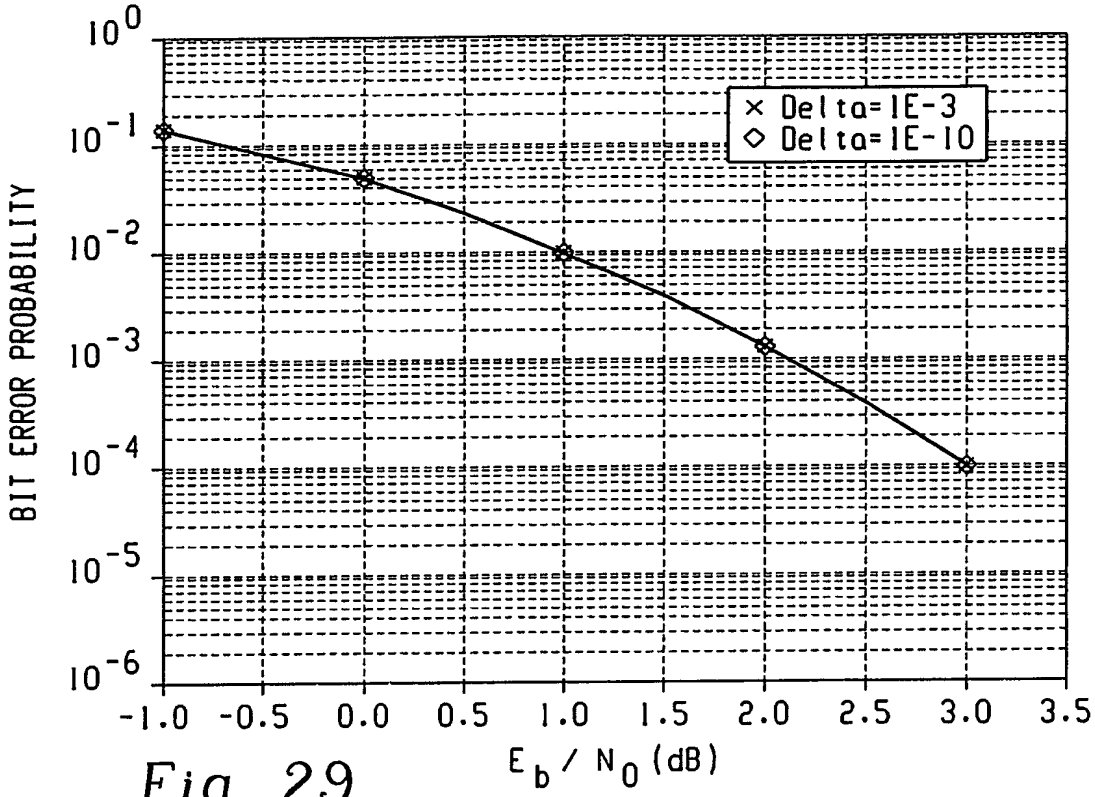
BIT ERROR PROBABILITY
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
× Delta=1E-3
◇ Delta=1E-10
-1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5
E_b / N_0 (dB)

Fig. 29

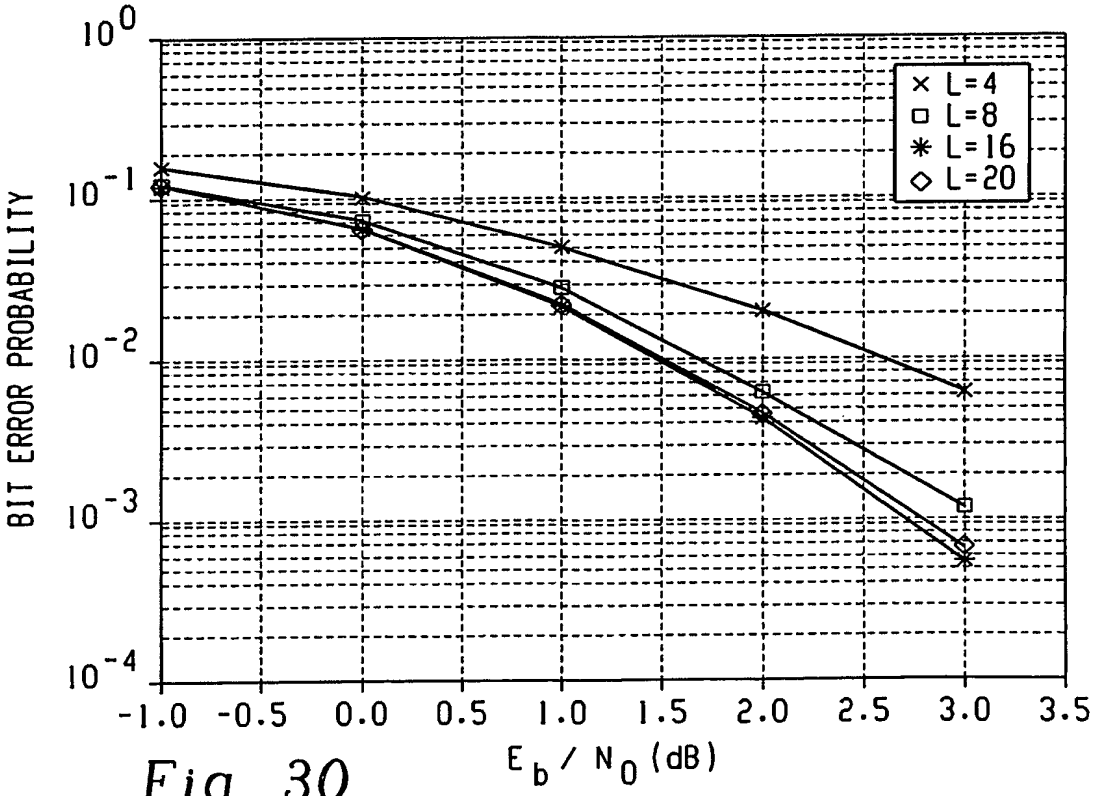
BIT ERROR PROBABILITY
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
× L=4
□ L=8
✱ L=16
◇ L=20
-1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5
E_b / N_0 (dB)

Fig. 30

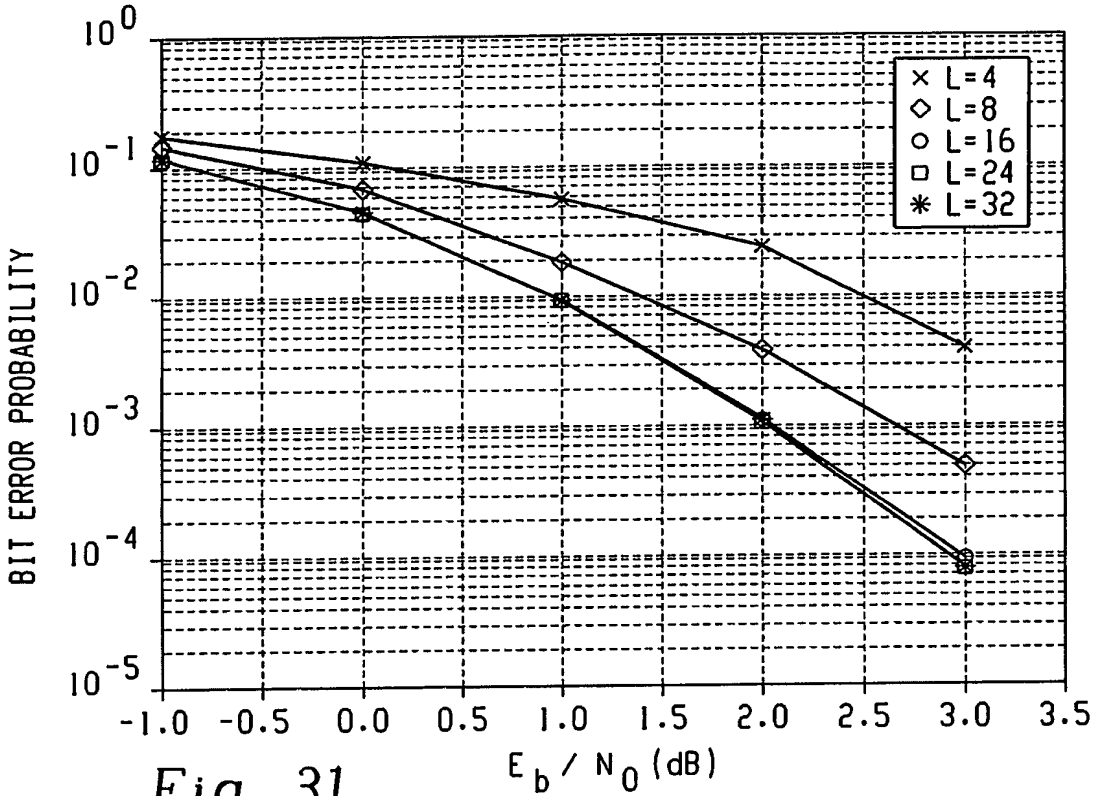
BIT ERROR PROBABILITY
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
-1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5
E_b / N_0 (dB)
× L=4
◇ L=8
○ L=16
□ L=24
✱ L=32

Fig. 31

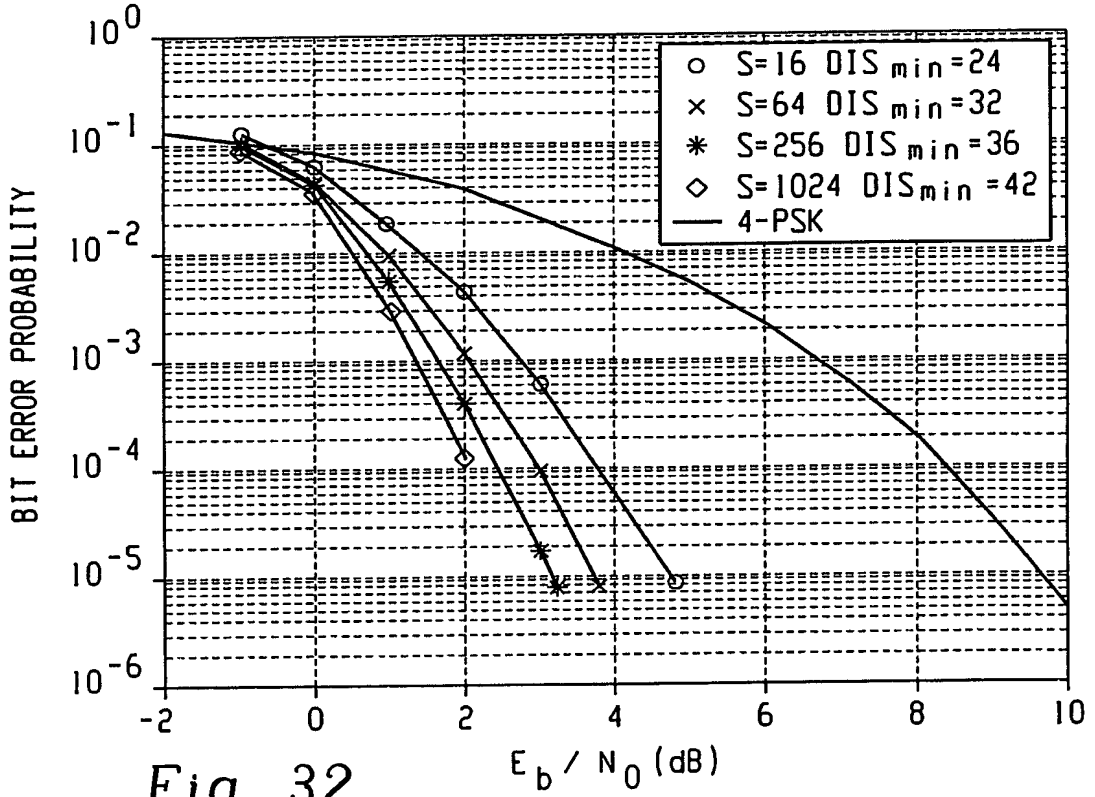
BIT ERROR PROBABILITY
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
-2 0 2 4 6 8 10
E_b / N_0 (dB)
○ S=16 DIS min=24
× S=64 DIS min=32
✱ S=256 DIS min=36
◇ S=1024 DIS min=42
— 4-PSK

Fig. 32

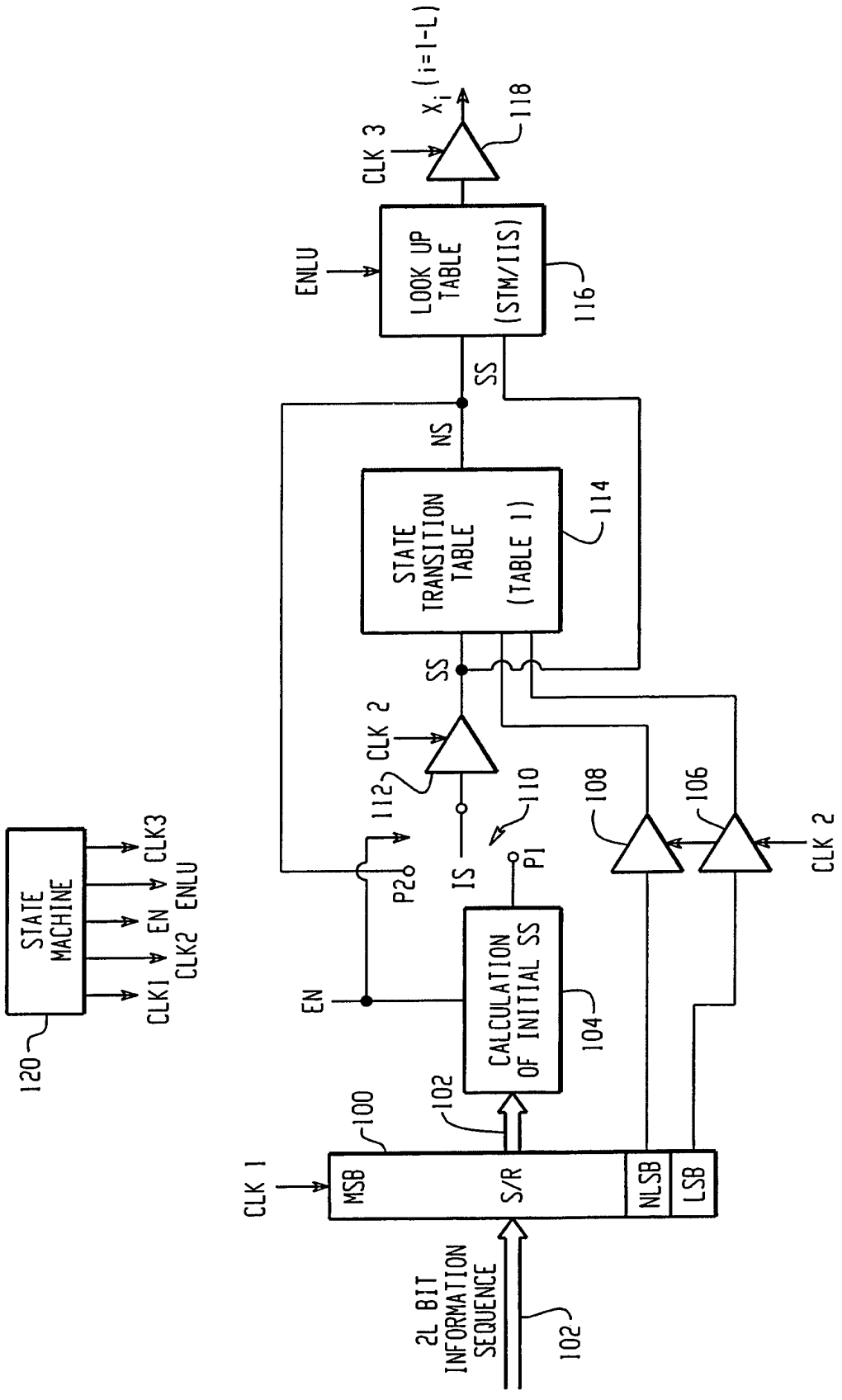
2L BIT INFORMATION SEQUENCE
102
CLK 1
MSB
S/R
NLSB
LSB
100
102
CALCULATION OF INITIAL SS
104
EN
P2
IS
P1
112
110
CLK 2
SS
STATE TRANSITION TABLE (TABLE 1)
114
NS
SS
LOOK UP TABLE (STM/IIS)
116
ENLU
CLK 3
X_i (i=1-L)
118
108
106
CLK 2
STATE MACHINE
120
CLK1 EN CLK3
CLK2 ENLU

Fig. 33

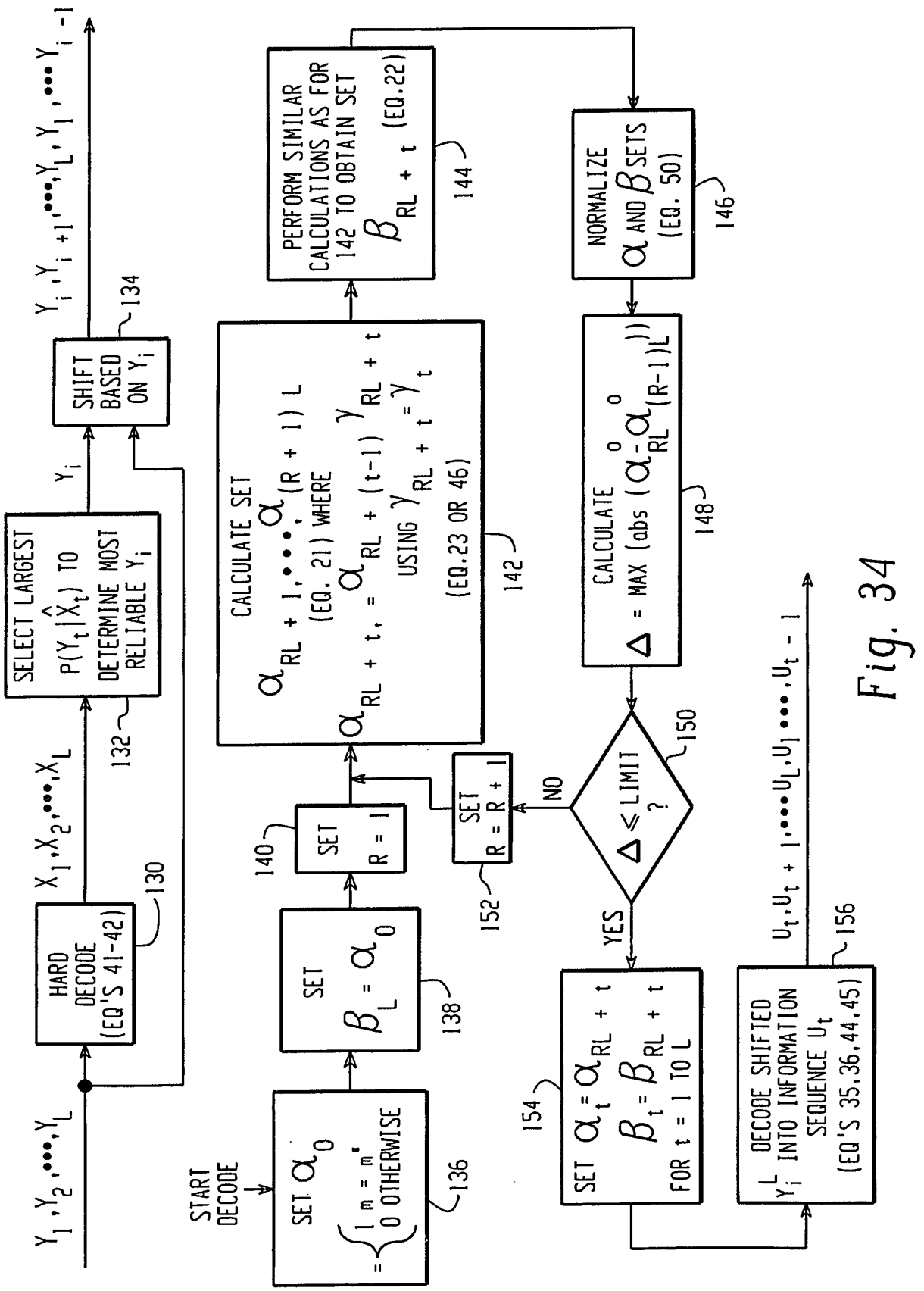
START DECODE
SET α_0 = { 1 m = m' ; 0 OTHERWISE }
136
SET $\beta_L = \alpha_0$
138
SET R = 1
140
HARD DECODE (EQ'S 41-42)
130
$X_1, X_2, \cdots, X_L$
SELECT LARGEST $P(Y_t|\hat{X}_t)$ TO DETERMINE MOST RELIABLE Y_i
132
Y_i
SHIFT BASED ON Y_i
134
$Y_1, Y_2, \cdots, Y_L$
$Y_i, Y_{i+1}, \cdots, Y_L, Y_1, \cdots Y_{i-1}$
SET R = R + 1
152
NO
CALCULATE SET $\alpha_{RL+1}, \cdots, \alpha_{(R+1)L}$ (EQ. 21) WHERE $\alpha_{RL+t'} = \alpha_{RL+(t-1)} \gamma_{RL+t}$ USING $\gamma_{RL+t} = \gamma_t$ (EQ.23 OR 46)
142
PERFORM SIMILAR CALCULATIONS AS FOR 142 TO OBTAIN SET β_{RL+t} (EQ.22)
144
$\Delta \leq$ LIMIT ?
150
YES
CALCULATE $\Delta = \text{MAX}(\text{abs}(\alpha - \alpha^0_{RL}))_{(R-1)L}$
148
NORMALIZE α AND β SETS (EQ. 50)
146
SET $\alpha_t = \alpha_{RL+t}$, $\beta_t = \beta_{RL+t}$ FOR t = 1 TO L
154
DECODE SHIFTED Y_i^L INTO INFORMATION SEQUENCE U_t (EQ'S 35,36,44,45)
156
$U_t, U_{t+1}, \cdots U_L, U_1 \cdots, U_{t-1}$

Fig. 34